

Contribution to Taxonomy and Distribution of the Genus *Elaphropoda* (Hymenoptera: Apidae: Apinae) in Vietnam

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ABSTRACT

Taxonomic notes on the genus *Elaphropoda* Lieftinck, 1966 (Hymenoptera: Apidae) from Vietnam are presented. Two species of the genus are reported: *Elaphropoda percarinata* (Cockerell, 1930) was first recorded from Vietnam based on specimens collected from Ha Tinh province in 1998, and is reconfirmed with a specimen collected from Bac Kan province in the Northeastern part of the country in this study, and *Elaphropoda khasiana* (Schulz, 1906) is recorded from Vietnam for the first time. Redescriptions of the male of *E. percarinata* and the female of *E. khasiana* are given with illustrations.

Keywords: Apidae, Apinae, *Elaphropoda*, new records, Vietnam

INTRODUCTION

The genus *Elaphropoda* Lieftinck, 1966 comprises 11 species worldwide (Ascher and Pickering, 2014). The species placed in this genus resemble *Apis* in general appearance, especially the females. They can be easily distinguished from related genera such as *Anthophora* Latreille, 1803 and *Habropoda* Smith, 1854 by the tridentate mandibles, closely approximated ocelli, sparsely pubescent legs and abdomen, and the great length of the marginal cell of the forewing (Lieftinck, 1966).

In Vietnam, two nationwide-faunistic of the family Apidae have been published, namely Le (2008) and Khuat et al. (2012), listing 41 and 35 species occurring in the country and northern part of the country respectively. There, however, was no record of the genus *Elaphropoda* from those two reviews. Recently, one species of this genus, *Elaphropoda percarinata* (Cockerell), was recorded from Vietnam by Ascher and Pickering (2014), based on specimens collected from Ha Tinh province in 1998 by Carpenter who joined the staff field trip of the Institute of Ecology and Biological Resources and the American Museum of Natural History to the province. In this paper, based on specimens deposited in the Institute of Ecology and Biological Resources (IEBR),

the occurrence of *Elaphropoda percarinata* in Vietnam is reconfirmed and the description of its male is provided, and *Elaphropoda khasiana* is newly recorded for Vietnamese fauna with the description of its female. Illustrations of the two species are provided.

MATERIALS AND METHODS

The material examined in the present study is deposited in the collections of the IEBR, Hanoi, Vietnam. Morphological and color characters of the pinned and dried specimens were observed under a stereoscopic dissecting microscope. Body length refers the length of head, mesosoma and first two metasomal segments combined.

Photographic images were made with the Leica M80 Stereo Microscope, using LAS exclusive microscopy software (LAS EZ 3.1.1); the plates were edited with Photoshop CS6.

Morphological terminology follows Michener (2007).

RESULTS AND DISCUSSION

Order Hymenoptera

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Family Apidae
Subfamily Apinae

Genus *Elaphropoda* Lieftinck, 1966
Elaphropoda Lieftinck, 1966: 148. Type species: *Habropoda impatiens* Lieftinck, 1944, by original designation.

Diagnosis. Diagnosis for the genus *Elaphropoda* were given by Lieftinck (1966) as follows: medium-sized, characteristics of tribe Anthophorini with elongate body and sparsely pubescent abdomen. Integument dark brown or black, the face, legs and parts of abdomen often predominantly light colored (ochraceous-orange). Pubescence throughout short and scanty, except on thorax, where it is long and dense; plumose hairs behind orbits, on thorax, and partly also on legs and gastral sterna. Disk of labrum and clypeus sparsely covered with long, erect, bristle-like hairs. Abdomen comparatively long and narrow, that of male even more slender with pointed apex, the intermediate and terminal segments cylindrical in cross-section. Integument well exposed under the short tomentum, terga not distinctly banded but posterior margins usually with narrow fringe of dense appressed pubescence; hair fringes of sterna longer, erect and plumose.

As remarked by Lieftinck (1966), the species of the genus *Elaphropoda* are restricted to the humid rain forests of the lower mountain zone (1,450–1,700 m). These bees are easily overlooked and very rare in collections. In this study, only one male of *E. percarinata* and one female of *E. khasiana* were collected.

Elaphropoda percarinata (Cockerell, 1930)

(Figs. 1A–F, 3A)

Habropoda percarinata Cockerell, 1930: 51–52, China: male (holotype, no. 644), SE China, Fukien, Foochow district, KELLOGG, in the British Museum (Nat. Hist.).

Elaphropoda percarinata Lieftinck, 1966: 157.

This species has been recorded from China (Xizang, Sichuan, Yunnan, Hunnan, Guangxi Zhuang), Taiwan, and Vietnam (Ascher and Pickering, 2014). In Vietnam, this species was recorded by Ascher and Pickering (2014) based on one female collected in Ha Tinh (17 km south-east Huong Son, 18°36'66.6"N, 105°21'66.6"E, 180 m, 19–23 Apr 1998, Carpenter JM).

Material examined. Bac Kan: 1 male, Kim Hy natural reserve, An Tinh, Na Ri, 22°12'31"N, 106°5'2"E, 3 Jun 2014, Nguyen LTP, Nguyen DD, Tran DD.

The male of this species was described by Cockerell in 1930. In this study, the male is redescribed with illustrations.

Redescription. Male: Body length: 10.5 mm; fore wing length: 10 mm. Tongue and clypeus long. Clypeus with a

median longitudinal stout keel from base to two-third of the clypeus, absent at one-third from apex (Fig. 1A). Labrum with two raised areas laterally at base. Length ratios of first four flagellomeres of antenna 12 : 5 : 10 : 10 (Fig. 1B). Hind wing with vein cu-v strongly oblique. The marginal cell long (Fig. 1C). First submarginal cell longer than second and third submarginal cells; second submarginal cell approximately equal to length of third submarginal cell (Fig. 1C). Abdomen long, the tergites broader than sternites (Fig. 1D, E). Fore, middle femur and tibia unmodified. Hind femur swollen. Hind tibia narrow at base and broader apically.

Clypeus except two large black marks laterally, a small triangular mark above clypeus, paraocular area from apex to near antennal socket, broad longitudinal band at center of labrum and mandibles except base and apex pale yellow. Two large marks on lateral sides of clypeus, paraocular area from base to near antennal socket, base and apex of mandible black. Two marks near lateral base of labrum brown, labrum grey except the broad longitudinal yellow band at the middle. Antenna with scape beneath yellow, first and half second flagellomeres red-fulvous and the rest of the flagellomeres brownish. Integument of tegula pale fulvous. Wings light flavo-hyaline, the nervures and stigma black. Abdomen black except the integument of the posterior margins of the first five gastral segments pale brownish yellow. Legs almost ochraceous orange, hind basitarsus conspicuously dark brown, and the tip of tarsal claws black (Fig. 1F).

Side of clypeus with brownish-black and sparse long bristles; hairs on labrum yellow and shorter. Frons with black long hairs, hairs behind eyes rather white; occiput with pale ochraceous and sparse hairs. Thorax with ochraceous orange and long dense hairs on dorsal part, the hairs paler and sparser on ventral and lateral parts. Posterior margins of the first five gastral segments with pale fulvous and short dense hairs.

Elaphropoda khasiana (Schulz, 1906)

(Figs. 2A–E, 3B)

Habropoda fulvipes Cameron, 1904: 211–212, female Khasia Hills, Assam: female (lectotype), labelled “Khasia”, ROTHNEY coll., in the University Museum, Oxford.

Anthophora khasianus Schulz, 1906: 253.

Elaphropoda khasiana Lieftinck, 1966: 152.

This species is known to occur in India (Uttarakhand, Jharkhand, Meghalaya) (Ascher and Pickering, 2014), and is newly recorded from Vietnam. The disjunct distribution records of this species are probably due to lack of intensive field work in the areas in the southern slope and western part of the eastern slope of the Himalayas, or it shows a disjunct distribution pattern. A similar disjunct distribution pattern is

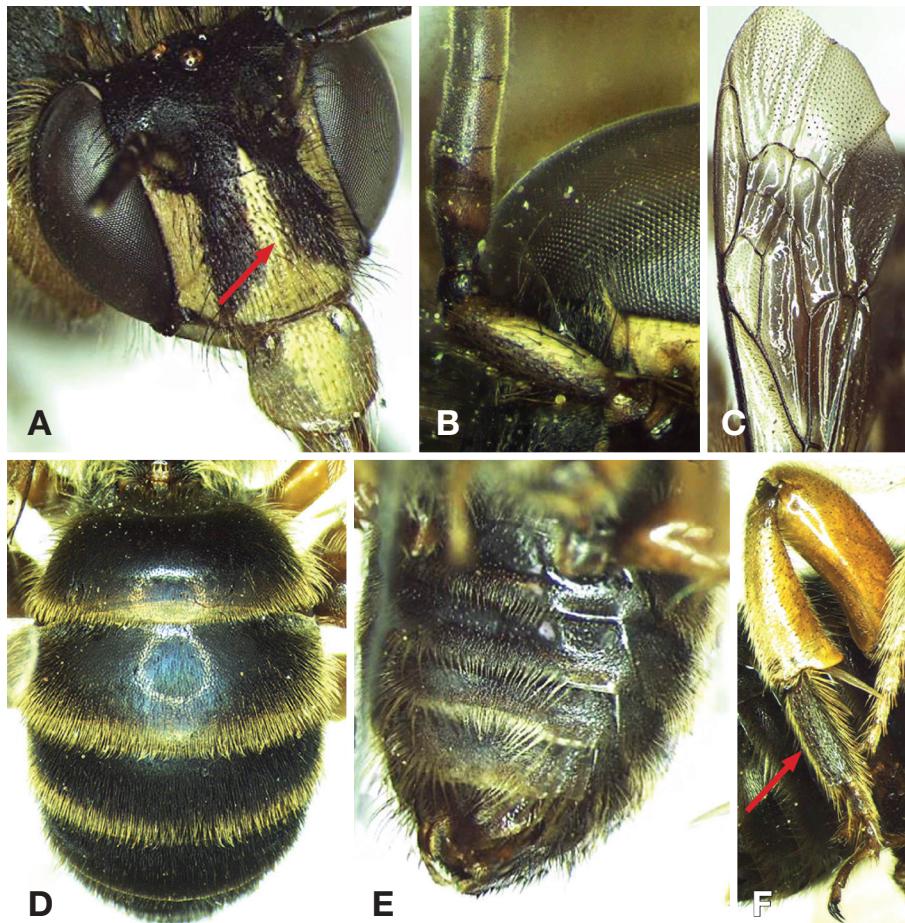


Fig. 1. *Elaphropoda percarinata*, male. A, Head, laterfrontal view; B, Left antenna, scape and 1–4 flagellomeres; C, Right forewing, marginal and submarginal cells; D, Abdomen, dorsal view; E, Abdomen, laterventral view; F, Hind basitarsus.

known in some social wasps such as *Polistes santoshae* Das and Gupta, 1989 and *Eustenogaster scitula* (Bingham, 1897) (see Nguyen et al., 2011).

Material examined. Tuyen Quang: 1 female, Son Phu ranger station, Na Hang natural reserve, Na Hang, 22°21'07"N, 105°25'34.7"E, 264 m, 9 Jun 2015, Nguyen LTP, Nguyen DD, Truong LX.

This species was collected around large yellow flowers carrying long curved spurs, which were growing in a wet area under shade. This area is similar to the area where *Elaphropoda impatiens* was collected as mentioned by Lieftinck (1944).

The female of this species was described very briefly by Cameron, 1904. In this paper, its female is redescribed with illustrations.

Redescription. Female: Body length: 9.5 mm; fore wing length: 10 mm. Tongue long. Clypeus with a median longitudinal stout keel from base to near apex, absent apically (Fig. 2A). Mandible with two preapical teeth. Antenna slen-

der, length of second flagellomere about two-thirds length of third flagellomere, length of flagellomeres 3–10 subequal, terminal flagellomere longest (Fig. 2B). First and third submarginal cells each longer than second submarginal cell and first recurrent vein joining second submarginal cell at apex of second submarginal cell (Fig. 2C). Hind wing with vein cu-v strongly oblique. Fore and middle femora and tibiae unmodified. Hind femur modified, swollen. Hind tibia longer than wide, modified and narrow at base, broader at apical, plate on outside at base of the hind tibia shield-shaped, roundly narrow towards the apex (Fig. 2D).

Clypeus except two small marks laterally, a broad triangular mark above the clypeus, labrum wholly and paraocular area from apex to near antennal socket, mandible except base and apex pale yellow. Two small marks on lateral sides of clypeus brownish, paraocular area from base to near antennal socket, mandible with base and apex black, middle part with fulvous spot. Antenna with scape beneath yellow, first and second flagellomeres red-fulvous and the rest of

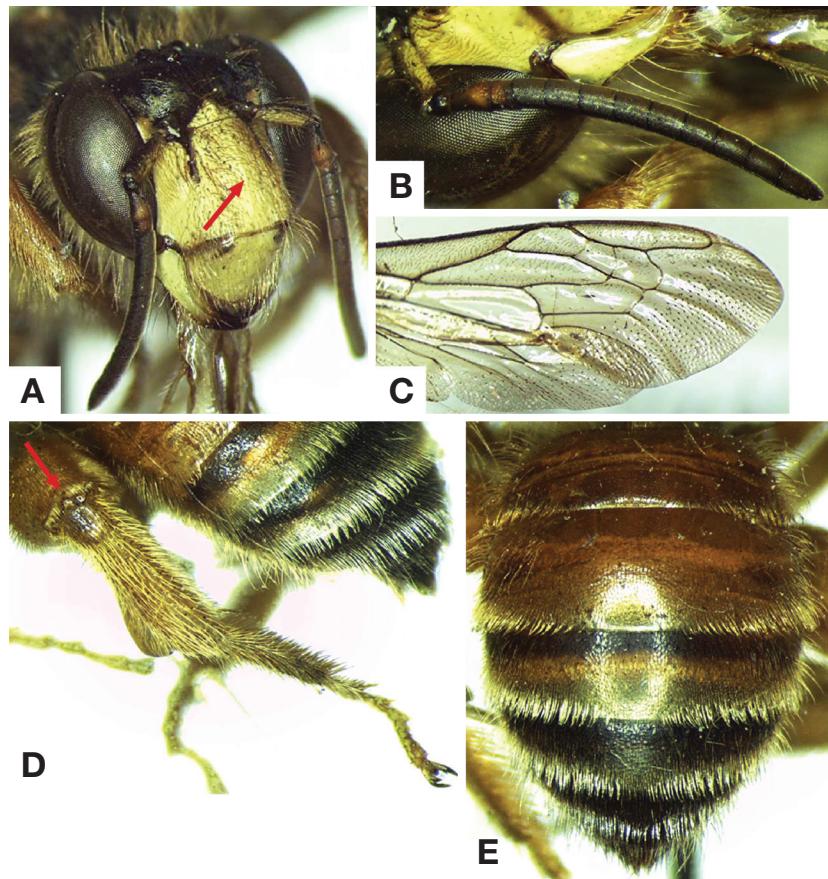


Fig. 2. *Elaphropoda khasiana*, female. A, Head, laterfrontal view; B, Right antenna; C, Right forewing, marginal and submarginal cells; D, Hind tibia; E, Abdomen, dorsal view.



Fig. 3. Habitus. A, *Elaphropoda percarinata*, male; B, *Elaphropoda khasiana*, female.

the flagellomeres dark brownish. Integument of tegula pale fulvous. Wings hyaline, the nervures and stigma black. The first two segments of the abdomen, a transverse band at

middle of third segment rufous and base of the third segment and the rest of the segments brownish-black, apex of third segment grey (Fig. 2E). Legs fulvous except coxa,

trochanter brownish and the tip of tarsal claws black.

Antenna with scape beneath, clypeus, a broad triangular mark above clypeus, labrum and mandibles with pale fulvous and long sparse hairs, paraocular area from apex to near antennal socket with paler and shorter hairs. Frons with black hairs. Thorax with fulvous hairs at dorsal part and silver-white hairs at ventral part. Abdomen with rather sparse and much shorter hairs than on the thorax, first to fourth abdominal segments with pale fulvous fringed at basal parts. Legs with pale fulvous hairs. Inner femur smooth and shiny, outer face of basitarsus with dense hairs, mediotarsus and distitarsus with sparser and bristle hairs.

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REFERENCES

- Ascher SJ, Pickering J, 2014. Discover Life Bee species guide and world checklist (Hymenoptera: Apoidea: Anthophila) [Internet]. Discover Life, Accessed 28 Aug 2015, <http://www.discoverlife.org/mp/20q?guide=Apoidea_species&flags=HAS&:flags=HAS>.
- Cameron P, 1904. Descriptions of new species of aculeate and parasitic Hymenoptera from Northern India. Annals and Magazine of Natural History, Series 7, 13:211-233. <http://dx.doi.org/10.1080/00222930408678900>
- Cockerell TDA, 1930. Descriptions and records of bees, CXX-IV. Annals and Magazine of Natural History, Series 10, 6:48-57. <http://dx.doi.org/10.1080/00222933008673186>
- Khuat LD, Le HX, Dang HT, Pham PH, 2012. A preliminary study on bees (Hymenoptera: Apoidea: Apiformes) from northern and north central Vietnam. TAP CHI SINH HOC, 34:419-426. <http://dx.doi.org/10.15625/0866-7160/v34n4-2676>
- Le HX, 2008. Diversity of bee superfamily (Hym.: Apoidea) from Vietnam. In: Proceedings of the 6th Vietnam National Conference on Entomology, Agriculture Publishing House, Hanoi, Vietnam, pp. 934-938 (in Vietnamese with summary in English).
- Lieftinck MA, 1944. Some Malaysian bees of the family Anthophoridae (Hym., Apoidea). Treubia (Dobutu Gaku-Iho), Hors Serie:57-138.
- Lieftinck MA, 1966. Notes on some anthophorine bees, mainly from the Old World (Apoidea). Tijdschrift voor Entomologie, 109:125-161.
- Michener CD, 2007. The bees of the world. 2nd ed. Johns Hopkins University Press, Baltimore, MD, pp. 1-953.
- Nguyen LTP, Kojima J, Saito F, 2011. *Polistes (Polistella)* wasps (Hymenoptera: Vespidae: Polistinae) from mountainous areas of northern Vietnam, with description of five new species. Zootaxa, 3060:1-30.
- Schulz WA, 1906. Spolia Hymenopterologica. Pape, Paderborn, pp. 1-356.
- Smith F, 1854. Catalogue of hymenopterous insects in the collection of the British Museum, Part 2. British Museum, London, pp. 199-465. <http://dx.doi.org/10.5962/bhl.title.20999>

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